

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions of claims:

Claim 1: (cancelled)

Claim 2: (cancelled)

Claim 3: (cancelled)

Claim 4: (cancelled)

Claim 5: (cancelled)

Claim 6: (cancelled)

1 Claim 7: (currently amended) An electron source comprising:
2 a cold cathode, wherein the cold cathode is substantially flat;
3 an evacuated vacuum envelope enclosing the cold cathode;
4 circuitry for creating an electric field sufficient to cause an electron beam to
5 be emitted from the cold cathode; and
6 a window in the evacuated vacuum envelope to permit passage of the electron
7 beam externally from the envelope.

1 Claim 8: (currently amended) A method for operating an electron source,
2 comprising the step of activating an electric field to cause an emission of an electron
3 beam from a cold cathode within an evacuated envelope in a manner so that the
4 electron beam passes externally from the envelope through a window in the envelope,
5 wherein the cold cathode is substantially flat.

1 Claim 9: (original) The method as recited in claim 8, further comprising the
2 step of positioning an object relative to the electron source so that the electron beam
3 emitted externally from the electron source irradiates the object, wherein the object is
4 external to the evacuated envelope.

1 Claim 10: (new) The electron source of claim 7, wherein the cold cathode
2 comprises a plurality of carbon nanotubes.

1 Claim 11: (new) The electron source of claim 7, wherein the cold cathode
2 comprises amorphic diamond emitters.

1 Claim 12: (new) The electron source of claim 10, wherein the plurality of
2 carbon nanotubes comprise single wall nanotubes.

1 Claim 13: (new) The electron source of claim 10, wherein the cold cathode
2 comprises a mixture of amorphous carbon, graphite diamond, and fullerene-type
3 carbon materials.

1 Claim 14: (new) The electron source of claim 7, wherein the evacuated
2 vacuum envelope is formed within a vessel, wherein the vessel is formed by a first
3 wall substantially parallel to a second wall, wherein the vessel is formed by a third
4 wall substantially parallel to a fourth wall, wherein the first wall is substantially
5 perpendicular to the third wall, wherein the second wall is substantially perpendicular
6 to the fourth wall, wherein the vessel comprises a fifth wall coupled to the first,
7 second, third, and fourth walls, wherein the cold cathode is coupled to the fifth wall,
8 wherein the fifth wall is substantially parallel to the window.

1 Claim 15: (new) The method as recited in claim 8, wherein the cold cathode
2 comprises a plurality of carbon nanotubes.

1 Claim 16: (new) The method as recited in claim 8, wherein the cold cathode
2 comprises amorphic diamond emitters.

1 Claim 17: (new) The method as recited in claim 15, wherein the plurality of
2 carbon nanotubes comprise single-wall nanotubes.

1 Claim 18: (new) The method as recited in claim 15, wherein the cold cathode
2 comprises a mixture of amorphous carbon, graphite diamond, and fullerene-type
3 carbon materials.

1 Claim 19: (new) The method as recited in claim 8, wherein the evacuated
2 vacuum envelope is formed within a vessel, wherein the vessel is formed by a first
3 wall substantially parallel to a second wall, wherein the vessel is formed by a third
4 wall substantially parallel to a fourth wall, wherein the first wall is substantially
5 perpendicular to the third wall, wherein the second wall is substantially perpendicular
6 to the fourth wall, wherein the vessel comprises a fifth wall coupled to the first,
7 second, third, and fourth walls, wherein the cold cathode is coupled to the fifth wall,
8 wherein the fifth wall is substantially parallel to the window.